

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA

SECONDARY EDUCATION CERTIFICATE LEVEL

SEPTEMBER 2017

SUBJECT:	Engineering Technology
PAPER NUMBER:	Synoptic – Unit 1
DATE:	1 st November 2017
TIME:	10:00 a.m. to 12:05 p.m.

**THIS PAPER SHOULD BE RETURNED TO THE INVIGILATOR
AFTER THE EXAMINATION.**

Answer ALL questions

Scenario:

The management of a local manufacturing company has noticed that the health and safety practices were being disregarded by some employees to the extent that injuries at the workshop had recently increased. To reverse this situation, the company is interested in engaging a health and safety officer to train new employees joining the company and retrain existing ones.

The company's Human Resources Department is asking you to complete this assignment to evaluate your suitability for the post of Health and Safety Officer as part of the selection process.

Question 1

K 1 (4 marks)

In one of the workshops labourers are required to continuously weld and grind metal in a very noisy environment. Twice a day, they also need to carry heavy bars of metal from one place to another.

List **FOUR** items of personal and protective equipment that labourers should wear at work.

Item 1 _____

Item 2 _____

Item 3 _____

Item 4 _____

Question 2

K 2 (4 marks)

Some employees are reluctant to wear specific PPE, as they do not understand their function. You are required to provide appropriate descriptions for a poster which is being prepared by the company to highlight the importance of the use of PPEs. Describe the functions of the PPEs below.

Safety Harness

High Visibility Vest

Hard Hat

Overall

Please turn the page.

Question 3

A 1 (15 marks)

Labourers from the Maintenance Department need to carry out maintenance work which includes setting up of scaffolding, painting of the façade and laying of membrane on the roof of the premises. The work is to be carried out in July when temperatures are high.

The law in Malta (Legal Notice 121 of 2003) clearly puts the responsibility of health and safety regulations, in particular the use of PPE, on both the employer and the worker.

As a Health and Safety Officer, identify **FIVE** PPEs that labourers need to make use of to minimise risks and explain the importance of each for this specific work.

PPE	Importance of PPE for this work

(5)






(10)

Question 4

K 3 (4 marks)

The warning signs, shown in Table 1 below, are found in different areas of the local manufacturing company. Identify the correct warning sign to the corresponding hazard. The first one is done for you.

Table 1

	<p>Acute toxicity</p>
	<p>Oxidising</p>
	<p>Environmental Hazard</p>
	<p>Gas Under Pressure</p>
	<p>Health Hazard</p>

Please turn the page.

Question 5

K 5 (4 marks)

Figure 1 shows typical work inside one of the manufacturing company's workshops. Some of the workers are violating health and safety standards and procedures.

Outline **FOUR** hazards shown in Figure 1. Mark the practice with a circle and give it a letter corresponding to your answer below.



Figure 1

Taken from: <https://www.slideshare.net/davrees/>

a. _____

b. _____

DO NOT WRITE ABOVE THIS LINE

c. _____

d. _____

Question 6

K 6 (3 marks)

Risk assessments are essential since these enable employers to identify who is at risk and provide measures to eliminate or control hazardous situations.

a. As a Health and Safety Officer, who would you forward the risk assessment to?

(1)

b. Why would you give the risk assessment to this person?

(2)

Please turn the page.

Question 7

A 2 (20 marks)

A new engineer has recently joined the manufacturing company. Most of his work will be based in the Research and Development Laboratory shown in Figure 2 below. You are requested to carry out a basic risk assessment by identifying **FOUR** potential hazards, risks associated, likelihood of occurrence, severity of risks and measures taken to minimise the effects.

Hazard	Risk	Likelihood of Occurrence (Low, Medium, High)	Severity of Risk (Low, Medium, High)	Measure taken to minimise risk
(1)	(1)	(½)	(½)	(2)
(1)	(1)	(½)	(½)	(2)
(1)	(1)	(½)	(½)	(2)
(1)	(1)	(½)	(½)	(2)



Figure 2

Taken from: www.lab-initio.com

Please turn the page.

Question 8

K 7 (8 marks)

- a. A wood worker in one of the company’s workshops is involved in a personal incident where foreign material ends up in his eye. Describe the first aid procedures taken to remove the foreign material in his eye.

(2)

- b. The company mechanic dismantles the fuel tank of a van. While doing this the tank bursts into flames.

- i. State the class of fire in this case.

(2)

- ii. Identify the extinguishing agent that is most suitable to put out the fire.

(2)

- iii. Describe the procedure to extinguish the fire.

(2)

Question 9

K 8 (4 marks)

In engineering companies, technical information is of utmost importance. This includes: Block diagram, Exploded view, Assembly diagram and Wiring schematic diagram.

Fill in Table 2 below, to match the diagram provided in the first column of Table 2 with the technical information mentioned above.

Table 2

Diagrams	Technical Information
<p>Taken from: https://electronics.stackexchange.com/</p>	
<p>Taken from: http://www.procarcare.com/</p>	
<p>Taken from: http://www.hobbyprojects.com/</p>	
<p>Taken from: http://www.clarkagequipment.com/</p>	

Please turn the page.

Question 10

K 9 (4 marks)

a. What is the gas inside a gas cylinder that is colour coded white?

_____ (1/2)

b. What is the gas inside a gas cylinder that is colour coded maroon?

_____ (1/2)

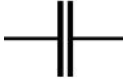

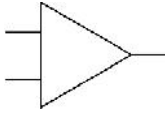
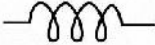
c. What is the abbreviation of stainless steel?

_____ (1/2)

d. What is the abbreviation of aluminium?

_____ (1/2)

e. Identify the symbols of the electronic components found in the table below.

Symbol	Component
	
	
	
	

(2)

Question 11

C1 (10 marks)

Health and Safety Officers give extensive training to staff dealing with dangerous substances in engineering companies. This is because substances can be toxic, flammable, corrosive, or harmful to people or the environment.

- a. Explain **FOUR** different points that are important when storing chemicals in cabinets.

(4)

- b. List **THREE** reasons why chemicals should be stored in appropriate containers which are correctly labelled.

(3)

- c. List **THREE** reasons why correct temperature conditions need to be maintained when storing chemicals.

(3)

Please turn the page.

Question 12

C 5 (10 marks)

Documents are very important for engineering companies since these provide important information which can be technical or administrative in nature. Documents must be well kept and easily retrieved when needed.

- a. Mention **FOUR** types of documents used in an engineering company.

(4)

- b. Explain how documents should be physically handled by mentioning **TWO** important measures.

(2)

- c. Explain how documentation should be stored by mentioning **TWO** important measures.

(2)

d. Explain how a documentation control system should function by mentioning **TWO** important measures.

(2)

Question 13

C 4 (10 marks)

Discuss the need for company employees to read and interpret accurately the following documents in an engineering company.

a. Health and Safety Procedures

(5)

b. Maintenance Manual

(5)

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